

We claim:

- 5  
B6
1. A process for modifying starch by heating starch with at least one cationic polymer in an aqueous medium to temperatures above the gelatinization temperature of said starch, which comprises selecting said starch from the group consisting of the native starches, the oxidized native starches, the starch ethers, the starch esters, the oxidized starch ethers, the oxidized starch esters, the cationic modified starches and the amphoteric starches and effecting said modifying of said starch in the presence of
- 10
- (a) a polymeric cationizer selected from the group consisting of the polymers containing vinylamine units and having molar masses Mw of up to 1 million, the polyethyleneimines, the polydiallyldimethylammonium chlorides, the condensates of dimethylamine with epichlorohydrin or dichloroalkanes, the condensates of dichloroethane and ammonia, and the mixtures thereof,
- 15
- and
- (b) polymeric papermaking drainage aids selected from the group consisting of the water-soluble crosslinked polyamidoamines with or without an ethyleneimine graft, the polymers containing acrylamide and/or methacrylamide units and having molar masses Mw of more than 1 million, the polymers containing vinylamine units and having molar masses of more than 1 million, and the mixtures thereof.
- 20
- 25
- 30
2. A process as claimed in claim 1, wherein
- a) said polymeric cationizer is selected from polyethyleneimines and/or polymers containing vinylamine units and having molar masses Mw of up to 1 million, and
- 35
- b) said polymeric drainage aids are selected from water-soluble ethyleneimine-grafted crosslinked polyamidoamines, polymers containing vinylamine units and having molar masses Mw of from 1.2 to 30 million, cationic polyacrylamides or nonionic polyacrylamides which each have molar masses Mw of not less than 1.5 million.
- 40
- 45

3. A process as claimed in claim 1 or 2, wherein said starch is a native starch.
4. A process as claimed in claim 1 or 2, wherein said starch is selected from the group consisting of the starch ethers, the starch esters, the oxidized native starch, the oxidized starch ethers and the oxidized starch esters.
5. A process as claimed in claim 1 or 2, wherein an anionic starch is used.
6. A process as claimed in claim 5, wherein said anionic starch contains carboxyl, phosphate or sulfate groups or the respective alkali metal or ammonium salts thereof.
7. A process as claimed in claim 5 or 6, wherein said anionic starch is carboxyl- and/or carboxylato-containing starch from potatoes, maize, wheat or tapioca.
8. A process as claimed in any of claims 1 to 7, wherein said starch is heated in said aqueous medium to 115 - 170°C under superatmospheric pressure.
9. A process as claimed in any of claims 1 to 8, wherein said heating of said starch is effected with at least one polymeric cationizer and at least one polymeric drainage aid in a jet cooker at from 120 to 150°C in the course of from 0.01 sec to 30 minutes.
10. A process as claimed in any of claims 1 to 9, wherein, based on 100 parts by weight of starch, from 0.1 to 10 parts by weight of at least one polymeric cationizer (a) and from 0.01 to 2 parts by weight of at least one drainage aid (b) are used.
11. Reaction products of starch with cationic polymers, obtainable by the process of claims 1 to 10.
12. The use of the reaction products obtainable by the process of claims 1 to 10 as paper, paperboard and cardboard dry strength enhancer.

Add A2

Add B1